



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/623,609	07/22/2003	Satoshi Seo	12732-087002	5062
26171	7590	02/27/2006	EXAMINER	
FISH & RICHARDSON P.C. P.O. BOX 1022 MINNEAPOLIS, MN 55440-1022			THOMPSON, CAMIE S	
			ART UNIT	PAPER NUMBER
			1774	

DATE MAILED: 02/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/623,609

Applicant(s)

SEO ET AL.

Examiner

Camie S. Thompson

Art Unit

1774

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Amendment filed December 13, 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) _____ is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 12/13/05.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. Applicant's amendment and accompanying remarks filed December 13, 2005 have been acknowledged.
2. Examiner acknowledges amended claims 129-138, 14-146, 153-154, 161-162 and 177-184.
3. The objection of claims 177-184 is withdrawn due to applicant's amended claims 177-184.
4. The rejection of claims 129-200 under 35 U.S.C. 102(e) as being anticipated by Aziz et al., U.S. Pre Grant Publication 2002/0145380 is withdrawn due to applicant's argument.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 129-130, 133-134, 137-144 and 153-160 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shi et al., U.S. Pre Grant Publication 6,130,001.

Shi discloses an organic EL device that includes a cathode, an organic electroluminescent layer and an anode, laminated in sequence (see column 1, lines 45-51). Additionally, the reference discloses that the first electrode is deposited atop of a substrate and is electrically conductive and optically transparent or semitransparent. The reference also discloses that the electrode can be

Art Unit: 1774

ITO, zinc oxide, zinc-tin oxide or polyaniline (see column 2, lines 16-29). Shi also discloses that a hole injecting layer deposited atop the first electrode and an organic electroluminescent medium layer is deposited atop the hole injecting layer (see Figure 1). The Figure also describes an electron injecting layer deposited atop the organic electroluminescent medium layer and a second electrode deposited atop the electron injecting layer. Column 7, lines 38-55 of the reference discloses the improvement of the organic EL efficiency by the incorporation of a small fraction of a dye or pigment of high fluorescent efficiency into the whole or part of the organic layer as per the instant claims. Shi does not disclose the thickness of the dopant. However, the reference does disclose that the dopant can be present in the organic medium layer as a small fraction. This is an optimizable feature. The incorporation of the dye or pigment provides high fluorescent efficiency. Discovery of optimum values of a result effective variable involves only routine skill in the art *in re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Therefore, it would have been obvious to one of ordinary skill in the art to have the thickness of the dopant in the amount of 10 nm in order to have an organic EL device with high efficiency. Also, column 7, lines 56-68 of the Shi reference discloses that the emission zone of the organic EL device is controlled by adjusting where in the continuous organic electroluminescent medium a fluorescent dye or pigment is incorporated and the concentration of the dye or pigment. It is disclosed in the reference that for efficient energy transfer, it is preferred that the fluorescent dye or pigment has a bandgap no greater than that of the host material making up the organic electroluminescent medium (see column 7, lines 44-48). The reference does not specifically disclose a hole transporting region or electron transporting region. However, the instant claims are not limited to a specific material and place no specific limit on properties such as hole

Art Unit: 1774

mobility. The Shi reference does disclose that in the continuous region the hole transporting component is present at 100% at the anode side and electron transporting component is present at 100% at the cathode side. Therefore, the portions having 100% in the continuous region of the Shi reference meet the transporting regions required by the instant claims. Reference claim 1 discloses that the layer of continuous organic electroluminescent medium has a thickness defined by a first edge and an oppositely opposed spaced apart edge. The reference does not provide the specific thickness of the light emitting region. However, this is an optimizable feature since the thickness of the reference is defined by a first edge and an oppositely opposed spaced apart edge. Discovery of optimum values of a result effective variable involves only routine skill in the art *in re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Therefore, it would have been obvious to one of ordinary skill in the art to have a thickness of the light emitting region of 30 nm in order to have an organic EL device that has improved efficiency and control of color emission.

7. Claims 131, 136, 145-52, 161-200 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shi et al., U.S. Patent Number 6,130,001 in view of Thompson et al., U.S. Patent Number 6,303,238.

Shi discloses an organic EL device that includes a cathode, an organic electroluminescent layer and an anode, laminated in sequence (see column 1, lines 45-51). Additionally, the reference discloses that the first electrode is deposited atop of a substrate and is electrically conductive and optically transparent or semitransparent. The reference also discloses that the electrode can be ITO, zinc oxide, zinc-tin oxide or polyaniline (see column 2, lines 16-29). Shi also discloses that a hole injecting layer deposited atop the first electrode and an organic electroluminescent medium layer is deposited atop the hole injecting layer (see Figure 1). The Figure also describes

Art Unit: 1774

an electron injecting layer deposited atop the organic electroluminescent medium layer and a second electrode deposited atop the electron injecting layer. Column 7, lines 38-55 of the reference discloses the improvement of the organic EL efficiency by the incorporation of a small fraction of a dye or pigment of high fluorescent efficiency into the whole or part of the organic layer as per the instant claims. Shi does not disclose the thickness of the dopant. However, the reference does disclose that the dopant can be present in the organic medium layer as a small fraction. This is an optimizable feature. The incorporation of the dye or pigment provides high fluorescent efficiency. Discovery of optimum values of a result effective variable involves only routine skill in the art *in re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Therefore, it would have been obvious to one of ordinary skill in the art to have the thickness of the dopant in the amount of 10 nm in order to have an organic EL device with high efficiency. Also, column 7, lines 56-68 of the Shi reference discloses that the emission zone of the organic EL device is controlled by adjusting where in the continuous organic electroluminescent medium a fluorescent dye or pigment is incorporated and the concentration of the dye or pigment. It is disclosed in the reference that for efficient energy transfer, it is preferred that the fluorescent dye or pigment has a bandgap no greater than that of the host material making up the organic electroluminescent medium (see column 7, lines 44-48). The reference does not specifically disclose a hole transporting region or electron transporting region. However, the instant claims are not limited to a specific material and place no specific limit on properties such as hole mobility. The Shi reference does disclose that in the continuous region the hole transporting component is present at 100% at the anode side and electron transporting component is present at 100% at the cathode side. Therefore, the portions having 100% in the continuous region of the

Art Unit: 1774

Shi reference meet the transporting regions required by the instant claims. Reference claim 1 discloses that the layer of continuous organic electroluminescent medium has a thickness defined by a first edge and an oppositely opposed spaced apart edge. The reference does not provide the specific thickness of the light emitting region. However, this is an optimizable feature since the thickness of the reference is defined by a first edge and an oppositely opposed spaced apart edge. Discovery of optimum values of a result effective variable involves only routine skill in the art *in re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Therefore, it would have been obvious to one of ordinary skill in the art to have a thickness of the light emitting region of 30 nm in order to have an organic EL device that has improved efficiency and control of color emission.

The Shi reference does not disclose the fluorescent pigment and dye as a triplet emitter. Thompson discloses a light emitting device that comprises a phosphorescent dopant, PtOEP, in the emissive layer. The Thompson reference discloses that PtOEP-doped OLED provide stability to the devices when exposed to ambient environmental conditions (see Thompson, column 4, lines 6-40). Therefore, it would have been obvious to one of ordinary skill in the art to have the dopant of the Thompson reference incorporated into a whole or part of the organic medium layer of the Shi reference in order to have a device that is highly efficient and stable. Also, the Thompson reference discloses that the hole transporting layer comprises TPD, α -NPD or β -NPD and tri-(8-hydroxyquinoline-aluminum as the electron transporting layer. These materials are well known in the art to be used in the hole transporting and electron transporting layers. Therefore, it would have been obvious to one of ordinary skill in the art to utilize TPD, α -NPD or β -NPD in the hole transporting region and and tri-(8-hydroxyquinoline-aluminum as the electron transporting layer in the Shi reference.


Art Unit: 1774

Response to Arguments

8. Applicant's arguments with respect to claims 129-200 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communication from the examiner should be directed to Camie S. Thompson whose telephone number is (571) 272-1530. The examiner can normally be reached on Monday through Friday from 7:30 am to 4:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena L Dye, can be reached at (571) 272-3186. The fax phone number for the Group is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


RENA DYE
SUPERVISORY PATENT EXAMINER
A.U. 1774 2/17/06